

BRFSS Data and Diabetes in Louisiana, 2002

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I. INTRODUCTION

Diabetes is the fifth leading cause of death in Louisiana (LA Vital Statistics, 2001). In 1996, Louisiana had the highest death rate due to diabetes (32.5 per 100,000) of all the other U.S. states. The total cost of diabetes in Louisiana, estimated for 1997, was over \$2.2 billion. This cost, which reflects estimates derived from known cases of diabetes, is likely an underestimation, given that about one-third of all diabetics are undiagnosed. The burden of the disease for the state of Louisiana is, on this evidence, quite significant.

Complications due to diabetes are numerous, serious and costly. Diabetes is the leading cause of blindness, kidney failure, non-traumatic leg and foot amputations, pregnancy complications, and deaths related to flu and pneumonia (CDC, 2001). The total costs of the disease are nearly \$100 billion a year nationwide.

Efforts to reduce the burden of disease due to diabetes should include minimal surveillance in order to identify high-risk groups, monitor health outcomes and indicators of the quality of health care recommended for people with diabetes, provide data to formulate health care policy, and evaluate progress in disease prevention and control. The Behavioral Risk Factor Surveillance Survey (BRFSS) serves this purpose by providing, among others, the Louisiana Diabetes Control Program (DCP) with analyses of diabetes care indicators (DCI).

This report presents analysis from the 2000 Louisiana Behavioral Risk Factor Surveillance Survey (BRFSS), with a specific focus on diabetes. The information provided by the BRFSS may be used to develop effective intervention strategies to reduce the burden of diabetes. Much of the burden of disease due to diabetes can be prevented with better education for diabetes self-management, early detection and treatment of complications, along with improved quality and delivery of care. Intensified efforts focused on high-risk groups including the elderly, Blacks, and the poor, represent another useful strategy in the fight against diabetes. These efforts include primary prevention through promotion of healthy behaviors that reduce obesity, such as proper nutrition and regular physical activity, and secondary prevention of diabetes complications through improved utilization of clinical preventive services, including regular foot exams, dilated eye exams, and improved blood glucose control.

This report is intended to support these aims by providing information necessary for evidence-based planning in the effort to reduce the burden of disease due to diabetes in the state of Louisiana.

II. BACKGROUND

Diabetes mellitus (diabetes) is a serious chronic disease caused by either a shortage of insulin or a decreased ability to use insulin, the hormone that allows glucose (sugar) to enter cells and be converted to energy. Uncontrolled, this deficiency leads to the damaging of vital organs, caused by the prolonged presence of glucose and fats in the blood (CDC, 2001).

There are different types of diabetes:

- **Type-1** diabetes, previously referred to as insulin-dependent diabetes or juvenile-onset diabetes, is one of the two main types of the disease, and may be due to autoimmune, genetic, and environmental factors. It may account for 5% - 10% of all diagnosed cases of diabetes.
- **Type-2** diabetes, previously referred to as non-insulin-dependent diabetes, is the other major type of diabetes, and accounts for about 90% - 95% of all diagnosed cases of diabetes. Risk factors for type-2 diabetes include older age, obesity, prior history of gestational diabetes, impaired glucose intolerance, race/ethnicity and lifestyle factors related to diet and physical activity. Although it was previously believed that type-2 diabetes mainly affected adults, children are increasingly being diagnosed with type-2 diabetes, thus necessitating the need for preventive measures aimed at all ages.
- **Gestational** diabetes, develops in about 2% - 5% of all pregnancies, but usually disappears when a pregnancy is over, although it predisposes the woman to a future diabetes diagnosis. Other less

prevalent types of diabetes result from specific genetic syndromes, surgery, drugs, malnutrition, infections and other illnesses (CDC, 2001).

¹III. METHODS

The BRFSS is the largest continuously conducted telephone health survey in the world. It enables state health departments to monitor risk behaviors related to chronic diseases, injuries and death. Since the early 1980s, BRFSS data has been used to assess risk for chronic diseases, identify emerging health issues, document health trends, compare health behaviors across states, and measure progress toward health goals. Data gathered through the BRFSS provides important information for the development of public health programs. As such, it is an effective tool in preventing disease and promoting health. Another strength of the BRFSS is comparability of data, enabled by the standardization of questions. This allows healthcare professionals to make state-by-state comparisons and track health trends over time.

A. Eligibility

Only non-institutionalized adults 18 years old and older, living in a household with a residential telephone, are eligible for participation.

B. Sampling

A Disproportionate Stratified Sample (DSS) Method was used. Phone numbers are randomly selected throughout the state. Business and non-working numbers are omitted. Individuals 18 years of age and older are then randomly selected from each household. Up to 15 attempts are made at different times of the day and week, to contact the individual.

C. Implementation

To ensure data quality, interviewers are specially trained to ask questions exactly the same way with each call. Interviewers use Computer Assisted Telephone Interview (CATI) software to manage telephone dialing and data collection. The CATI standardized interview takes approximately 20 minutes. Responses are entered directly into the computer by interviewers.

D. The Instrument

The BRFSS questionnaire has five sections: fixed core, rotating cores, optional modules, emerging cores and state-added questions.

The fixed core questions cover topics such as health status, health insurance, routine checkup, diabetes, smoking, pregnancy, women's health, HIV/AIDS and demographics. The rotating core questions are asked every other year, and cover such topics as hypertension, injuries, and colorectal screening in odd-numbered years and weight control, fruit and vegetable consumption and physical activities in even-numbered years. States can select from a list of standardized questions based on need. These are the optional modules, which may be more in-depth, covering topics such as diabetes care indicators, tobacco use prevention, health care coverage and utilization, and quality of life. Finally, state-added may be added to reflect particular needs not covered in the core or optional modules. As an example, the state of Louisiana has sought permission to include a state-added question in the diabetes module that specifically asks whether the diabetic knows what type of diabetes he or she has.

¹ The methodology is derived from CDC's introduction to the BRFSS.

E. Analysis

The analyses presented in this report are of a descriptive nature. Descriptive analyses enable access to a broad-based audience so that the potential use of the report is maximized. Thus more sophisticated statistical analyses are omitted in favor of straightforward descriptions according to select categories of interest.

IV. RESULTS

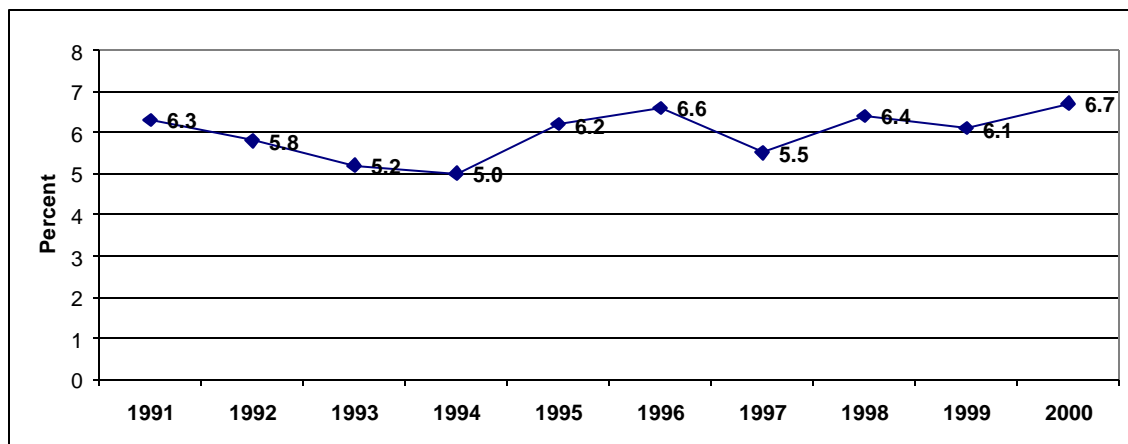
The analysis in this report is based on the 2000 BRFSS. It captures the latest known information on the behavioral risk factors of Louisiana adults who responded “yes” to the question, “Have you ever been told by a doctor that you have diabetes?” In 2000, approximately 7% of adults in Louisiana, or 208,500 adults, reported that they had been diagnosed with diabetes. Conventional knowledge on diabetes suggests that about one-third of all diabetics are undiagnosed. On that basis, a little over one in ten adult Louisianans have diabetes. About one-third (31%) of diagnosed Louisiana diabetics are on insulin. Some disparities emerge out of these total figures, as shown both in Table 1 and in Figure 2.

Accumulated evidence from experts in diabetes suggests that diabetics taking insulin generally receive better care than diabetics not taking insulin. Although diabetics on insulin are generally higher medical priorities, there need not be disparities in the quality of care, especially preventive care measures, as all diabetics are at risk of rapid progression if appropriate preventive actions are not taken in the management of their disease. Differences between these two groups are presented throughout the analysis to highlight areas of need.

A. Prevalence

Figure 1 presents the prevalence estimates for diagnosed diabetes among adult Louisianans from 1991-2000. The prevalence of diagnosed diabetes saw a precipitous drop in the early part of the 1990’s, reaching its lowest levels in 1994, when it was 5%. Those gains suffered a setback by the mid-‘90’s, when the prevalence of diagnosed diabetes began to rise again. The average prevalence over the past three years has been 6.4%, but it remains to be seen whether the modest rise from 1999 to 2000 represents a new upward trend.

Figure 1. Prevalence of self-reported diabetes among adults, LA 1991-2000, BRFSS



Chronic Disease Epidemiology Unit, Louisiana Office of Public Health

1. By select demographics and insulin use

Blacks have a higher prevalence of diabetes, at 9%, than Whites (5.9%). In terms of gender, adult women over 18 years old in Louisiana have a higher prevalence of diabetes than men (7.5% vs. 5.7%). The likelihood of having diabetes increases with age among Louisianans, with the highest prevalence found among those 65 years or older (14.6%), and the lowest prevalence found in those <45 years of age (2.3%). The age-specific distribution observed for Louisiana diabetics reflects the age-specific distribution found at the national level. It is estimated that 18% of the adult population in the U.S. aged 65-74 has diabetes. The prevalence for the same age-group (65-74 years) in Louisiana is 14.6%. Thus, for the oldest age group compared (64-75 years), adult Louisianans have a lower overall prevalence than the national average.

As might be expected, those with higher levels of educational attainment have higher total household incomes. The prevalence of diabetes is higher for adult Louisianans from households with lower total incomes, and for those with lower educational attainment, as shown in Table 1. The observed association might be explained by general life stresses and limited choices at lower household income levels that increase the risk for diabetes. However, the association between total household income and diabetes is modified by race. At the lowest household income, Whites (14.4%) have a higher prevalence of diabetes than Blacks (11.2%). But Blacks have a higher prevalence of diabetes than Whites at every other level of total household income.

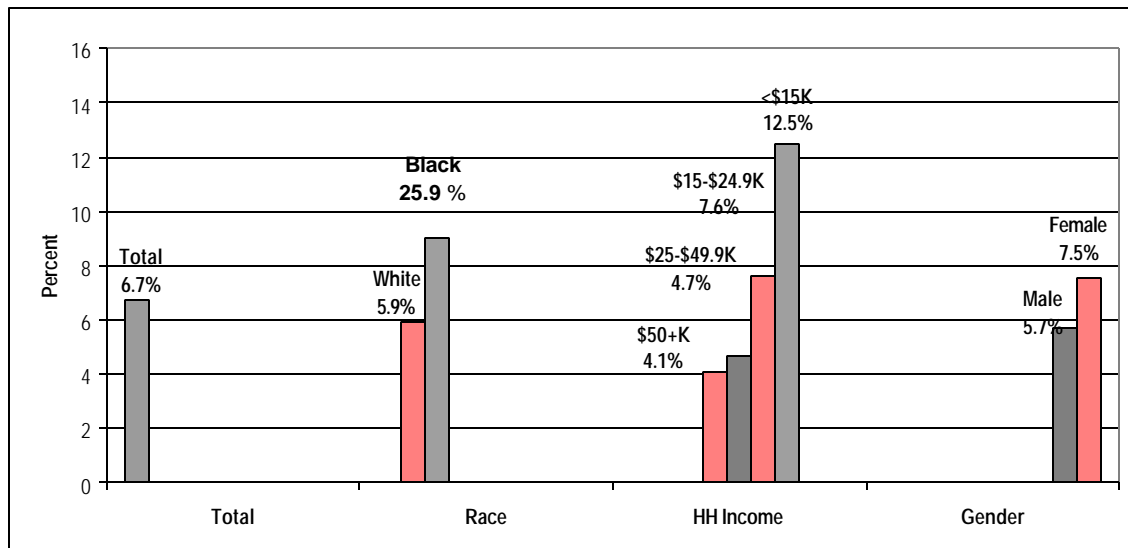
The prevalence of diabetes is highest for Louisianans “unable to work” (25.3%) and for retired Louisianans (13.4%). For unemployed Louisianans and for students/homemakers, the prevalence of diabetes is approximately 5%, while employed Louisianans have a prevalence of approximately 4%. While the relatively higher prevalence among retired persons is likely indicative of the increased risk associated with increasing age, it is noteworthy that the highest prevalence is found for those unable to work. On this evidence, one in four of all Louisianans who are unable to work are affected by diabetes.

Table 1. Prevalence of diabetes among adults, overall and by select categories, LA, 2000 BRFSS

	Category (N)	n	Weighted percent	Weighted n
Total (5006)		347	6.7%	208,495
Race	Black (1331)	123	9.0%	74,178
	White (3319)	204	5.9%	121,833
	Hispanic (214)	11	4.9%	7,508
Gender	Female (3129)	234	7.5%	123,271
	Male (1877)	113	5.7%	85,224
Age	<45 years (2536)	61	2.3%	38,731
	45 - 64 years (1565)	160	10.3%	93,500
	65+ years (860)	124	14.6%	75,136
HH Income	<\$15,000 (725)	88	12.5%	50,230
	\$15,000 - \$24,999 (988)	75	7.6%	46,377
	\$25,000 - \$49,999 (1446)	72	4.7%	43,912
	\$50,000+ (1094)	50	4.1%	29,099
Employment	Employed (2944)	117	3.7%	68,785
	Unemployed (164)	11	5.0%	118,173
	Homemaker / Student (738)	37	4.6%	21,238
	Retired (829)	111	13.4%	66,071
	Unable to work (323)	70	25.3%	46,590
Education	Less than HS Grad (816)	104	12.7%	66,349
	HS Grad or GED (1787)	114	6.1%	71,476
	Some College or College Grad (2386)	129	4.9%	70,670
Insulin	Users	103	31.3%	64,052
	Non-users	240	68.7%	140,533

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

Figure 2. Diabetes prevalence in Louisiana, overall and by select demographics, LA 2000, BRFSS



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B. Access to care

One of the important determinants of health, generally, is the extent to which people have access to care when they need it. In the case of a costly chronic disease like diabetes, health coverage is an even more important determinant of the frequency and quality of care received. This section examines the relative access of Louisiana diabetics to healthcare. The variables examined are:

- Any healthcare coverage
- Medicare coverage
- Under-insurance
- Annual flu vaccination and
- Pneumonia vaccination

1. Health insurance

Overall, nearly one in five (20%) of Louisiana diabetics answered “No” to the question, “Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare?” The analysis by demographics is presented in Table 2 and Figure 3.

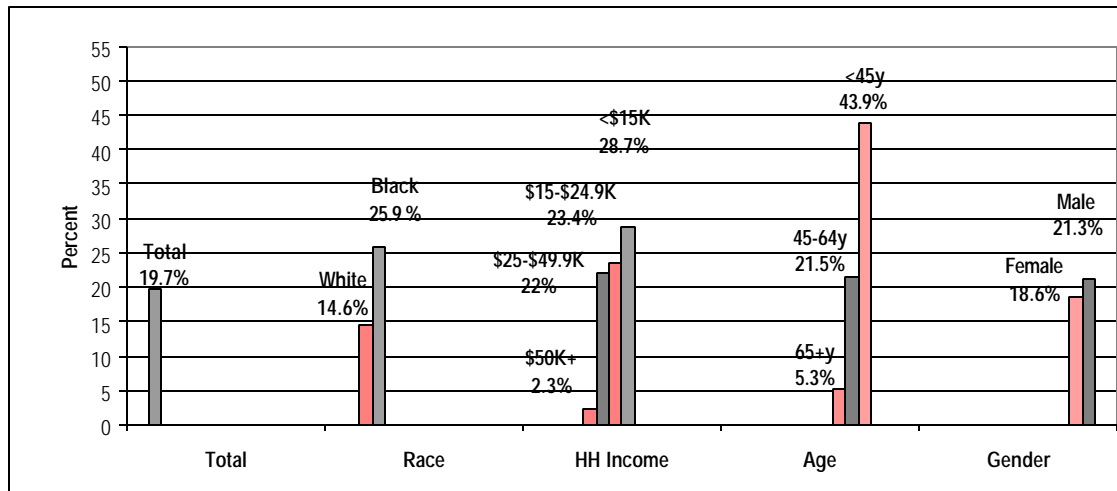
Table 2. Diabetics without health insurance, LA, 2000 BRFSS

	Category (N)	n	Weighted percent	Weighted n
Total (343)		64	19.7%	40,716
Race	Black (122)	31	25.9%	19,128
	White (201)	28	14.6%	17,598
Gender	Female (230)	43	18.6%	22,588
	Male (113)	21	21.3%	18,128
Age	<45 years (60)	25	43.9%	16,714
	45 - 64 years (159)	34	21.5%	20,048
	65+ years (122)	5	5.3%	3,953
HH Income	<\$15,000 (88)	27	28.7%	14,426
	\$15,000 - \$24,999 (74)	16	23.4%	10,721
	\$25,000 - \$49,999 (72)	11	22.0%	9,658
	\$50,000+ (50)	1	2.3%	661
Insulin	Users (102)	18	18.6%	11,826
	Non-users (237)	43	18.2%	25,362

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

Approximately one in five Louisiana diabetics are uninsured. This may contribute to sub-optimal access to needed healthcare services. Proportionately more Black diabetics (26%) than White diabetics (15%) are without health insurance, which might be reflective of the fact that more Blacks than Whites are in the lowest household income group. Younger adult diabetics (<45 years) in Louisiana are proportionately more likely to be uninsured, compared with diabetics in the older (65+ years) age group (44% vs. 5%), which is consistent with findings related to the insurance status of the general adult population of Louisiana. This reflects the fact that adults 65 years and older automatically qualify for Medicare.

Figure 3. Diabetics without health insurance, LA 2000, BRFSS



Chronic Disease Epidemiology Unit, LA Office of Public Health

2. Medicare coverage

Medicare coverage is an important source of insurance for older adults (65 years and over), and for younger persons with disabilities and end-stage renal disease. According to the 2000 Louisiana BRFSS, approximately 40% of diabetics have Medicare coverage. By contrast, only 18.5% of adult Louisianans who are non-diabetic have Medicare coverage, suggesting that Medicare is an important source of health insurance for adult Louisianans who have diabetes. In terms of proportions, Black diabetics and White diabetics have about the same level of Medicare coverage, females with diabetes have more coverage, and older diabetics have more coverage, as might be expected. Finally, diabetics from households with low total income are proportionately more likely to be covered by Medicare.

Table 3. Proportion of Louisiana diabetics and non-diabetics with Medicare coverage, LA, 2000 BRFSS

		Diabetics (343)		Non-Diabetics (4637)	
	Category (N)	n (Weighted %)	Weighted n	n (Weighted %)	Weighted n
Total		140 (41.6%)	85,968	920 (18.5%)	536,989
Race	Black	45 (42.3%)	31,217	207 (15.6%)	115,992
	White	88 (41.8%)	50,335	655 (20.2%)	390,086
Gender	Female	100 (45.8%)	55,718	615 (20.6%)	313,698
	Male	40 (35.4%)	30,250	305 (16.1%)	223,291
Age	<45 years	4 (12.8%)	4,880	112 (4.1%)	67,665
	45 - 64 years	27 (17.4%)	16,238	149 (9.8%)	80,096
	65+ years	108 (86.2%)	64,153	644 (87.4%)	381,557
Income	<\$15,000	44 (48.4%)	24,309	232 (35.7%)	123,276
	\$15,000 - \$24,999	28 (43.5%)	19,904	222 (23.5%)	132,207
	\$25,000 - \$49,999	22 (29.1%)	12,768	190 (13.3%)	119,252
	\$50,000+	8 (16.1%)	4,700	76 (7.8%)	53,207
Insulin	Users	48 (49.7%)	31,671	na	na
	Non-users	91 (38.7%)	53,915	na	na

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

3. Under-insured

Under-insurance (the inability to see a doctor when needed because of cost, despite having some form of medical insurance) presents another important impediment to access to health care services. Table 4 presents the proportion of adult Louisiana diabetics who are under-insured.

Table 4. Under-insurance among diabetics, LA, 2000 BRFSS

	Category (N)	n	Weighted percent	Weighted n
Total (343)		32	9.1%	18,795
Race	Black (122)	8	7.3%	5,382
	White (201)	22	10.0%	12,077
Gender	Female (230)	24	10.4%	12,698
	Male (113)	8	7.2%	6,097
Age	<45 years (60)	6	6.8%	2,588
	45 - 64 years (159)	15	9.6%	8,907
	65+ years (122)	10	9.2%	6,869
Income	<\$15,000 (88)	13	16.0%	8,048
	\$15,000 - \$24,999 (74)	10	13.5%	6,180
	\$25,000 - \$49,999 (72)	3	3.7%	1,638
	\$50,000+ (50)	3	5.1%	1,496
Insulin	Users (102)	13	11.0%	7,037
	Non-users (237)	19	8.4%	11,757

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

Overall, approximately one in ten (9%) of adult Louisiana diabetics reported that they are under-insured. Proportionately more White diabetics (10%) than African-American diabetics (7%) are under-insured. The percentage rate of under-insurance is highest for diabetics from households with the lowest total income (16%), and lowest for Louisiana diabetics from households with the highest total income (5%). Finally, female Louisiana diabetics were proportionately more likely (10.4%) to be under-insured compared with male Louisiana diabetics (7.2%). The overall picture raises legitimate concerns. If 20% of Louisiana diabetics are uninsured, and another 10% are under-insured, then approximately one in three of adult Louisiana diabetics is possibly not getting optimal healthcare as needed.

4. Annual flu vaccination

Diabetics are more likely than non-diabetics to suffer from complications and to die of influenza or pneumonia. It is thus recommended that diabetics get an annual flu shot as a necessary precaution. This preventive measure is presented in this section (Table 5) as a proxy for access to needed services. The total number of diabetics shown to have responded to this question (119) is about one-third of the total number of diabetics identified for the 2000 BRFSS. The deficit is not due to lack of response. Rather, in the interest of cost-efficiency, the total sample was sub-divided into three tracks, for the administering of different State-added modules. Thus questions related to immunization were asked of respondents in track 2, of which there were 123 diabetics. More than half of Louisiana diabetics (57%) had not received a flu shot within the last year.

Table 5. Diabetics who have NOT had flu shot during past year LA, 2000 BRFSS

	Category (N)	n	Weighted percent	Weighted n
Total (119)		68	56.5%	119,723
Race	Black (*45)	29	62.4%	47,752
	White (69)	36	51.4%	63,964
Gender	Female (74)	42	56.2%	63,366
	Male (*45)	26	56.8%	56,357
Age	<45 years (*23)	15	59.5%	23,122
	45 - 64 years (51)	37	74.8%	71,120
	65+ years (*43)	15	31.3%	23,464
Income	<\$15,000 (*27)	15	52.8%	23,778
	\$15,000 - \$24,999 (*25)	18	59.2%	25,488
	\$25,000 - \$49,999 (*26)	16	65.5%	32,457
	\$50,000+ (*17)	7	43.2%	13,301
Insulin	Users (*39)	27	68.3%	50,237
	Non-users (80)	41	50.2%	69,486

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

Although the numbers are small, Black diabetics and diabetics on insulin appear not to be getting annual flu shots, even though they are more vulnerable to the complications of diabetes. Proportionately more middle-aged Louisiana diabetics (75%) had not had a flu shot; although the numbers are small, one-third of diabetics in the oldest age group reported not having had a flu shot during the previous year, even though this is the group with the highest rates of flu and pneumonia-related mortality.

5. Ever had pneumonia vaccination

Pneumococcal disease kills more people in the United States each year than all other vaccine-preventable diseases combined, and people with diabetes are at greater risk. People with diabetes are about three times more likely to die of flu and pneumonia. Moreover, a pneumonia shot can also protect against other infections caused by the same bacteria. However, nationally, only about one in three adults with diabetes ever get a simple, safe pneumonia shot. A pneumonia shot every 10 years is recommended for anyone aged two years or older who might be at higher risk of getting pneumonia due to an existing chronic condition, such as diabetes.

Table 6. Diabetics who have never had a pneumonia vaccine LA, 2000 BRFSS

	Category (N)	n	Weighted percent	Weighted n
Total (113)		76	66.9%	133,782
Race	Black (*44)	29	69.5%	52,528
	White (65)	44	63.9%	74,176
Gender	Female (70)	46	67.9%	72,928
	Male (*43)	30	65.8%	60,853
Age	<45 years (*22)	20	94.5%	34,528
	45 - 64 years (*48)	35	74.1%	65,958
	65+ years (*41)	20	45.2%	32,272
Income	<\$15,000 (*25)	14	51.7%	20,480
	\$15,000 - \$24,999 (*23)	14	60.1%	24,034
	\$25,000 - \$49,999 (*25)	18	71.4%	33,601
	\$50,000+ (*16)	13	80.5%	23,980
Insulin	Users (*36)	27	79.0%	54,893
	Non-users (77)	49	60.5%	78,889

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

Persons living with diabetes in Louisiana reported never receiving a pneumonia vaccination at about the national rate (67%). This is an alarming finding, given the excess risk of morbidity and mortality to diabetics from pneumonia, and considering that the vaccine is safe and offers lifetime protection for most people.

C. Preventive Care Practices

Reducing the burden of disease due to diabetes requires, above all, effective preventive measures to reduce the incidence of diabetes. Additionally, it requires active and effective management of the disease by those affected and those who treat them. There are standard recommended practices that diabetics and their care providers can follow to prevent the complication of disease among those already affected by diabetes. These include:

- Daily self blood-glucose check
- Daily self-check of feet
- Annual physician visit specifically for diabetes
- Annual eye exam
- Annual foot exam
- Quarterly HgA1c check

1. Self-management practices

a. Daily self-blood glucose check

The ultimate end of diabetes management is keeping blood sugar levels within a normal range. It is recommended that diabetics monitor their blood glucose levels several times a day, but at least once a day, a minimal recommendation not met by over half (51%) of Louisiana's diabetics (Table 7 and Figure 4).

Table 7. Diabetics not performing daily blood glucose check, LA 2000 BRFSS

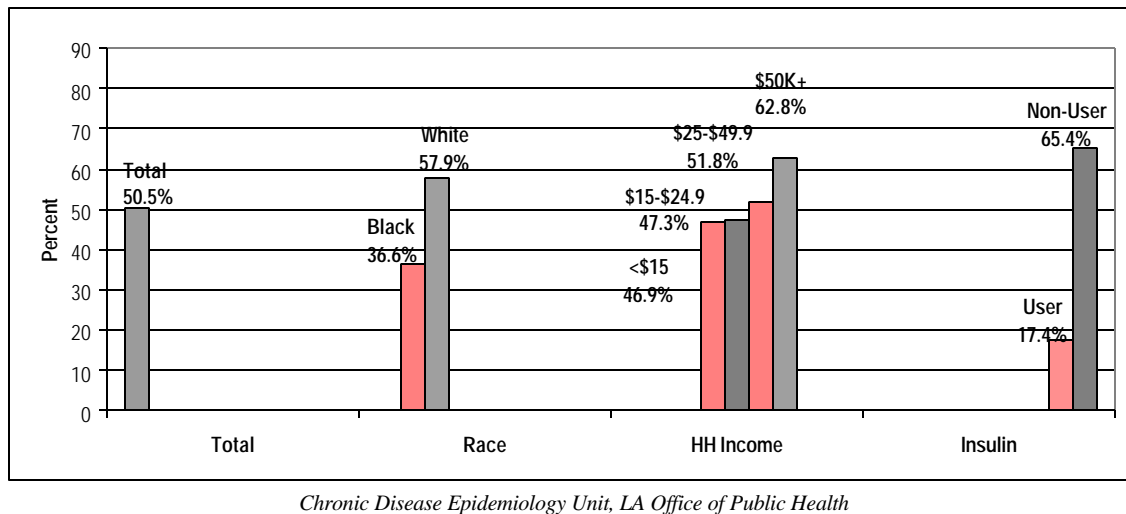
	Category (N)	n	Weighted percent	Weighted n
Total (335)		173	50.5%	101,208
Race	Black (117)	47	36.6%	25,328
	White (198)	112	57.9%	68,550
Gender	Female (227)	107	45.5%	54,386
	Male (108)	66	58.1%	46,821
Age	<45 years (58)	25	36.7%	13,533
	45 - 64 years (155)	88	56.1%	50,117
	65+ years (120)	59	50.6%	36,860
Income	<\$15,000 (86)	39	46.9%	23,104
	\$15,000 - \$24,999 (72)	37	47.3%	20,232
	\$25,000 - \$49,999 (69)	37	51.8%	22,001
	\$50,000+ (50)	31	62.8%	18,275
Insulin	Users (100)	19	17.4%	10,854
	Non-users (231)	70	65.4%	90,354

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

Proportionately more White diabetics (58%) than Black diabetics (37%) failed to check their blood glucose at least once a day, and compared with female diabetics (46%), male diabetics are proportionately more likely (58%) to miss checking their blood glucose at least once a day. Notably, over half (51%) of

Louisiana diabetics 65 years old or older, who are generally at increased risk for complications, failed to perform this necessary preventive measure. The source of greatest disparity in this preventive measure is between diabetics who are on insulin and those who are not. Two important points emerge from the discrepancy: (1) non-users of insulin do not appear to be doing well managing their diabetes, since the number one goal of diabetes management is controlling high blood sugar levels, and daily self-checks are an important component of this goal; (2) for insulin users, specifically, missing daily blood glucose might precipitate other complications. It raises concern that an insulin user would fail to monitor his or her blood glucose levels before the use of insulin. Insulin users who reported that they missed checking their blood glucose at least once a day are at risk for negative health consequences.

Figure 4. Diabetics not performing daily self-checks of blood glucose levels, LA 2000, BRFSS



b. Daily self-check of feet for sores or irritations

Diabetes is the leading cause of lower limb amputation. However, a considerable proportion of these amputations may be prevented through simple but effective foot care practices. This includes daily self feet-checks, a preventive measure to detect any cut, sore, swelling or infection that might progress if undetected, and lead to complications possibly resulting in lower extremity amputation

Table 8. Diabetics not performing daily feet check, LA, 2000 BRFSS

	Category (N)	n	Weighted percent	Weighted n
Total (332)		91	28.7%	56,896
Race	Black (117)	27	24.4%	16,687
	White (196)	56	30.7%	36,208
Gender	Female (223)	60	28.5%	33,277
	Male (109)	31	29.1%	23,620
Age	<45 years (59)	15	23.0%	8,640
	45 - 64 years (153)	35	23.0%	20,230
	65+ years (118)	40	38.2%	27,320
Income	<\$15,000 (87)	22	27.1%	13,436
	\$15,000 - \$24,999 (71)	18	27.0%	11,372
	\$25,000 - \$49,999 (70)	15	19.2%	8,224
	\$50,000+ (50)	16	32.5%	9,459
Insulin	Users (101)	21	26.1%	16,388
	Non-users (231)	70	29.9%	40,509

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

Overall, nearly one in three (29%) of Louisiana diabetics reported that they did not check their own feet at least once a day. Proportionately more White diabetics (31%) than Black diabetics (24%) reported that they do not check their feet at least once a day. With this preventive measure as well, the highest proportion of diabetics not meeting the recommendation is the oldest (65+ years) age group (38%), who are already at elevated risk for complications.

c. Any sores on feet that took 4+ weeks to heal

The need for daily feet check is underscored by the fact that a diabetic might find a lingering sore or ulcer, which should prompt an immediate consultation with a health professional. Due to the potential for nerve damage, it is possible for sores to go undetected, and progress to an advanced state, when it is impossible to save the patient's limb. This indicator then is a good example of the complementary roles that patients and providers can play in ensuring optimum management of the disease.

Approximately 11% of Louisiana diabetics reported that they had had sores on their feet that took 4 weeks or more to heal. This indicator of potential nerve damage and risk for loss of limb is proportionately higher for White diabetics (13%) and for female diabetics (13%), as shown in Table 9. The oldest group of diabetics (14%) had this complication at approximately twice the rate of the youngest group (8%). The prevalence among diabetics with the lowest total household income (17%) was more than 4 times as prevalent among diabetics with the highest total household income (4%).

Table 9. Diabetics who had foot sores that took 4+ weeks to heal, LA, 2000 BRFSS

	Category (N)	n	Weighted Percent	Weighted n
Total (339)		36	11.4%	23,012
Race	Black (118)	9	8.6%	5,947
	White (201)	24	12.9%	15,560
Gender	Female (228)	27	13.3%	15,888
	Male (111)	9	8.6%	7,124
Age	<45 years (59)	4	7.7%	2,894
	45 - 64 years (156)	17	11.0%	9,811
	65+ years (122)	15	13.9%	10,308
Income	<\$15,000 (87)	14	17.3%	8,605
	\$15,000 - \$24,999 (71)	8	25.6%	5,031
	\$25,000 - \$49,999 (72)	5	8.5%	3,750
	\$50,000+ (*49)	2	3.8%	1,094
Insulin	Users (101)	13	12.9%	8,100
	Non-users (238)	23	10.7%	14,912

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

d. Classes in self-management of diabetes

For those with diabetes, a thorough understanding of the disease is critical to knowing how to properly manage it. Moreover, although recommendations on preventive care are consistent, forgetfulness occurs, and new information is constantly being accrued on best practices. This is why it is important for diabetics and their families to take classes that allow them to stay updated and informed on best self-management practices. Overall, about 45% of adult Louisiana diabetics have not yet taken a course in how to manage their diabetes (Table 10).

It is noteworthy that older Louisiana diabetics (65 years and older), who are most vulnerable to morbidity, have the highest proportion of never having taken a self-management course. Proportionately, more White diabetics (48%) than Black diabetics (40%) reported that they have never taken a class on how to manage their diabetes, and more non-insulin users (50%) than insulin-users (35%) reported never having taken a class on how to manage their diabetes. It is not evident where these affected persons are getting their information on managing their disease.

Table 10. Diabetics who have never taken a class on how to manage their diabetes, LA, 2000 BRFSS

	Category (N)	n	Weighted Percent	Weight n
Total (338)		155	45.1%	91,216
Race	Black (118)	51	39.5%	27,630
	White (200)	95	47.9%	57,246
Gender	Female (227)	106	46.4%	55,556
	Male (111)	49	43.3%	35,659
Age	<45 years (59)	14	21.4%	8,054
	45 - 64 years (157)	67	40.8%	36,777
	65+ years (120)	74	63.4%	46,385
Income	<\$15,000 (86)	46	50.4%	24,813
	\$15,000 - \$24,999 (73)	26	32.2%	13,997
	\$25,000 - \$49,999 (71)	30	39.6%	17,279
	\$50,000+ (50)	21	43.8%	12,750
Insulin	Users (99)	32	35.1%	21,703
	Non-users (239)	123	49.6%	69,513

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

2. Doctor or health professional checks

a. Number of times seen a doctor for diabetes in past 12 months

It is important that persons with diabetes see a doctor or other health professional specifically for their diabetes. Diabetes has the unfortunate distinction of being one of the few chronic diseases that must be actively managed on a daily basis. The adult person affected must perform the tasks addressed earlier, such as daily self-checks of blood glucose and of the lower limbs for sores or irritations.

In addition, the affected persons need to consult regularly with a health professional. Ideally, diabetics should get an HgA1c check once every three months, or four times in a year, which would imply a physician visit at that frequency. We examine this variable using this recommendation as the standard.

Table 11. Diabetics who did NOT see a doctor at least 4 times in past year, LA, 2000 BRFSS

	Category (N)	n	Weighted percent	Weighted n
Total (322)		155	45.5%	87,276
Race	Black (112)	39	35.0%	22,639
	White (191)	106	51.7%	59,693
Gender	Female (214)	101	43.6%	49,119
	Male (108)	54	48.2%	38,158
Age	<45 years (59)	31	52.4%	19,701
	45 - 64 years (149)	77	47.3%	40,588
	65+ years (112)	46	39.0%	26,290
Income	<\$15,000 (85)	33	41.3%	20,171
	\$15,000 - \$24,999 (67)	30	38.0%	14,680
	\$25,000 - \$49,999 (70)	40	52.3%	22,565
	\$50,000+ (*49)	28	56.1%	16,019
Insulin	Users (95)	33	33.7%	20,336
	Non-users (227)	122	50.9%	66,941

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

Overall, approximately 46% of Louisiana diabetics did not see a doctor or health professional at the recommended level of at least four times in the past year. Over half of Louisiana's White diabetics (52%) and over one-third (35%) of Black diabetics did not meet this recommendation. Total household income did not present as a particular distinction for meeting this requirement. More notable is that well over one-third of diabetics 65 years or older did not meet this recommendation.

b. HgA1c check

The Hg A1C test is the most reliable method for determining average blood sugar levels over the previous three months. Diabetics are advised to have this test once every three months. Since the test provides the best indication of blood sugar over the previous three months, health professionals can make the necessary determination on how to proceed with care, including insulin adjustment. A potentially complicating factor in the analysis of this variable is that some respondents report never having heard of HgA1c, although this does not necessarily mean that they have not had the test. In the current data, 40 diabetics (15.5%) reported that they had never heard of HgA1c. Including them in the analysis would bias the proportion either upwards (if they are assumed to have had the test), or downwards (if they are assumed not to have had the test).

To minimize bias in either direction, the proportions are therefore based on the respondents who had heard of the HgA1c test. The 40 diabetics (representing a weighted proportion of 15.5% of all adult diabetics), are thus left out of both the numerator and denominator.

Overall, 68% of Louisiana's adult diabetics did not meet the recommendation of receiving an HgA1c test once every three months, or quarterly over the course of the previous 12 months (Table 12).

Table 12. Proportion of diabetics with less than four annual HgA1c checks, out of those who have heard of the HgA1c check, LA, 2000 BRFSS

	Category (N)	n	Weighted percent	Weighted n
Total (246)		181	68.0%	97,090
Race	Black (80)	63	72.0%	33,147
	White (154)	112	67.8%	60,887
Gender	Female (167)	127	70.3%	59,718
	Male (79)	54	64.7%	37,373
Age	<45 years (*48)	38	75.5%	22,021
	45 - 64 years (121)	92	69.6%	46,942
	65+ years (75)	50	60.9%	27,429
Income	<\$15,000 (60)	39	60.4%	20,403
	\$15,000 - \$24, (*47)	33	61.1%	16,909
	\$25,000 - \$49,999 (56)	45	76.0%	24,804
	\$50,000 (*47)	39	79.9%	21,640
Insulin	Users (72)	46	59.2%	25,934
	Non-users (174)	135	71.9%	71,156

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

As presented in Table 12, in none of the categories of Louisiana's adult diabetic population was this recommendation met to any appreciable extent, suggesting that adult diabetics of Louisiana are not receiving the state-of-the-art in blood glucose monitoring and attendant recommendations. Louisiana diabetics from households with the highest total income have the highest rate of neglect in getting at least four annual HgA1c tests.

c. Foot exam

Besides checking their own feet, diabetics are advised to have a health professional check their feet at least once a year. While self-examinations of the feet allow a patient to catch any sore or cuts that might progress if undetected, medical professionals have the proficiency to, among other aspects of complications, detect signs of nerve damage and prescribe appropriate measures. Overall, more than one in three (34%) adult Louisiana diabetics did not receive a foot exam in the 12 months prior to the survey (Table 13 and Figure 4).

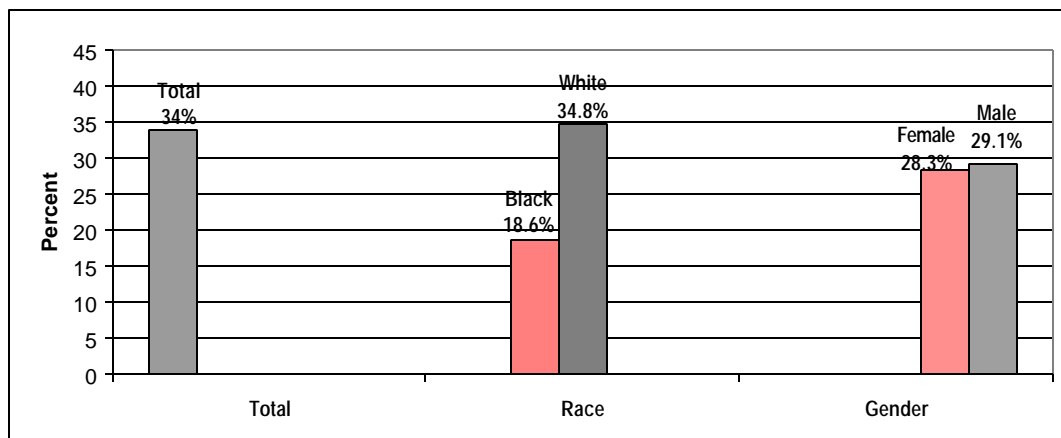
Table 13. Diabetics who did not receive an annual foot exam from a health professional LA, 2000

	Category (N)	n	Weighted percent	Weighted n
Total (308)		98	34.0%	67,061
Race	Black (105)	22	18.6%	11,462
	White (185)	71	34.8%	38,845
Gender	Female (209)	70	28.3%	30,837
	Male (99)	28	29.1%	21,816
Age	<45 years (55)	15	28.2%	9,556
	45 - 64 years (146)	52	31.3%	26,324
	65+ years (105)	31	25.9%	16,774
Income	<\$15,000 (80)	23	24.0%	10,952
	\$15,000 - \$24,999 (67)	24	35.0%	13,651
	\$25,000 - \$49,999 (69)	23	29.6%	12,394
	\$50,000+ (*46)	20	43.6%	11,743
Insulin	Users (91)	19	15.8%	9,014
	Non-users (217)	79	34.4%	43,640

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

Louisiana's White adult diabetics are about two-times as likely as Black diabetics to report not receiving a foot exam. Another source of considerable disparity is between insulin users (19%) and non-users (34%), with the latter group over two times as likely to report not receiving an annual foot exam, an example of a disparity that need not exist.

Figure 5. Proportion of adult diabetics who did not receive an annual foot exam, LA 2000, BRFSS



Chronic Disease Epidemiology Unit, LA Office of Public Health

d. Eye-exam

Diabetes is the leading cause of new cases of blindness in adults 20 to 74 years old. Thus, it is important that diabetics get their eyes checked at least once a year, to enable early detection of signs of retinopathy, and to allow appropriate measures to be taken.

Over one-third (34%) of Louisiana diabetics did not have an eye-exam in the previous year (Table 14). For most of the categories, the proportion is in the mid-30 percent range. One notable exception is in the age-specific distribution. The younger group (<45 years old) has the highest proportion (46.9%) compared with 26.2% of the older age group (65 years or older). On average, a higher proportion of diabetics from households with lower total incomes (<\$25,000) did not receive an annual eye exam, compared with diabetics from households with higher total income (\$25,000 and above (40% versus 30%).

Table 14. Diabetics who did not receive an annual eye exam, LA, 2000 BRFSS

	Category (N)	n	Weighted Percent	Weight n
Total (332)		119	34.0%	67,061
Race	Black (116)	44	35.8%	24,200
	White (196)	68	32.2%	37,702
Gender	Female (224)	79	31.5%	37,096
	Male (108)	40	37.7%	29,965
Age	<45 years (57)	28	46.9%	16,591
	45 - 64 years (155)	58	35.2%	31,134
	65+ years (118)	32	26.2%	18,905
Income	<\$15,000 (85)	32	37.7%	18,444
	\$15,000 - \$24,999 (71)	30	41.6%	17,121
	\$25,000 - \$49,999 (71)	22	29.4%	12,636
	\$50,000+ (*49)	17	30.4%	8,634
Insulin	Users (94)	31	31.5%	18,339
	Non-users (238)	88	35.1%	48,723

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

e. Told by a doctor that diabetes has affected eyes

Each year, diabetic retinopathy causes 12,000 to 24,000 new cases of blindness. This evidence suggests that an annual eye exam is an important preventive care measure for diabetics. For diabetics who have been informed that the illness has already affected their eyes, additional preventive and care practices are likely to be needed. Overall, 27% of Louisiana diabetics reported that a doctor had told them that diabetes has affected their eyes (Table 15).

Table 15. Diabetics who have been told by doctor that diabetes has affected eyes, LA, 2000

	Category (N)	n	Weighted Percent	Weight n
Total (335)		85	27.0%	53,694
Race	Black (118)	35	31.1%	21,783
	White (197)	45	24.4%	28,443
Gender	Female (226)	57	25.9%	30,775
	Male (109)	28	28.6%	22,919
Age	<45 years (59)	15	28.5%	10,695
	45 - 64 years (155)	37	22.4%	19,675
	65+ years (119)	32	31.6%	22,893
Income	<\$15,000 (86)	28	33.4%	16,415
	\$15,000 - \$24,999 (72)	20	28.4%	12,140
	\$25,000 - \$49,999 (69)	13	22.4%	9,271
	\$50,000+ (50)	7	16.3%	4,728
Insulin	Users (98)	39	40.4%	24,689
	Non-users (237)	46	21.0%	29,005

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

Black diabetics (31%), diabetics 65 years and older (32%), and diabetics from households with the lowest total income (33%) had higher proportions of those who had been told diabetes has affected their eyes, compared to Whites (24.4%), younger adults between 45 and 64 years old (22.4%), and diabetics from households with the highest total income (16.3%), respectively. In addition, diabetics on insulin are almost twice as likely as those not on insulin to report having been told that the illness has affected their eyes.

D. Co-risk factors

Diabetics are at higher risk than non-diabetics for morbidity and mortality. Death rates have been found to be twice as high among middle-aged diabetics than middle-aged non-diabetics. Hence, reducing the burden of disease due to diabetes also requires monitoring diabetics on risk factors associated with other morbidity and mortality outcomes, including influenza, pneumonia, heart disease, and stroke.

Risk factors that may potentially speed the progression of disease in diabetics and impose excess morbidity and mortality include tobacco use and lifestyle choices in nutrition and level of physical activity that may lead to obesity. The following section examines the distribution of some important risk factors among Louisiana diabetics.

1. Physical activity

a. Any exercise

The benefits of even moderate exercise in delaying and possibly preventing several chronic diseases, including diabetes, are well established. Combined with a moderate, nutritionally balanced diet, moderate physical activity is critical for physiological balance and well-being. The BRFSS defines “any exercise” as participation, over the previous month, in any physical activities such as running, calisthenics, golf, gardening, or walking, outside of the duties of one’s regular work. As shown in Table 16, more than half (55%) of Louisiana diabetics reported that they had not exercised at all over the month prior to the survey.

Table 16. Diabetics who did not participate in any physical activities or exercises such as running, calisthenics, golf, gardening or walking for exercise during the past month, LA, 2000 BRFSS

	Category (N)	n	Weighted Percent	Weight n
Total (347)		181	54.8%	114,328
Race	Black (123)	62	55.0%	40,786
	White (204)	111	56.4%	68,719
Gender	Female (234)	125	55.8%	68,762
	Male (113)	56	53.5%	45,566
Age	<45 years (61)	21	40.9%	15,846
	45 - 64 years (160)	83	54.5%	50,943
	65+ years (124)	76	62.7%	47,109
Income	<\$15,000 (88)	47	51.8%	26,007
	\$15,000 - \$24,999 (75)	39	60.3%	27,985
	\$25,000 - \$49,999 (72)	34	49.1%	21,566
	\$50,000+ (50)	19	43.0%	12,508
Insulin	Now taking insulin (103)	69	68.5%	43,860
	Not taking insulin (240)	110	48.2%	67,704

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

Diabetics on insulin (69%), and diabetics 65 years old and older (63%), who stand to benefit considerably from being moderately active, have the highest proportions of being physically inactive. This level of physical inactivity bodes poorly for the overall health of Louisiana diabetics.

b. Level of physical activity

The benefits of physical activity are greater when physical activity is regular and sustained. The BRFSS defines regular and sustained activity level as engaging in a physical activity or pair of physical activities for 30 minutes or more per session, five or more times per week, regardless of intensity. In Louisiana, about nine in ten (90%) diabetics do not engage in regular and sustained activity as defined above. This high rate of lack of regular and sustained activity applies to all the groups analyzed.

Table 17. Diabetics who reported no physical activity or pair of physical activities that were done for less than 30 minutes and/or fewer than five times per week, LA, 2000 BRFSS

	Category (N)	n	Weighted Percent	Weight n
Total (347)		310	89.9%	187,418
Race	Black (123)	110	89.7%	66,517
	White (204)	182	89.6%	109,215
Gender	Female (234)	214	91.6%	112,868
	Male (113)	96	87.5%	74,550
Age	<45 years (61)	51	86.3%	33,440
	45 - 64 years (160)	148	93.3%	87,216
	65+ years (124)	110	88.3%	66,331
Income	<\$15,000 (88)	78	88.0%	44,182
	\$15,000 - \$24,999 (75)	68	92.0%	42,665
	\$25,000 - \$49,999 (72)	61	85.3%	37,466
	\$50,000+ (50)	44	89.4%	26,003
Insulin	Users (103)	95	93.1%	59,653
	Non-users (240)	211	88.1%	123,856

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

2. Tobacco use

a. Smoking status

Tobacco use, even without the complication of other chronic diseases, is one of the most important risk factors for morbidity and mortality. Combined with the complications of other chronic diseases such as diabetes, it greatly increases the risk of stroke and cardiovascular health problems. The prevalence of current smoking is presented in Table 18, comparing diabetics within categories, and comparing diabetics with non-diabetics.

Table 18. Prevalence of current smoking among diabetics, LA, 2000 BRFSS

		Diabetics (346)		Non-Diabetics (4640)		
		Category (N)	(n) Weighted %	Weight n	(n) Weighted %	Weighted n
Total			(51) 16.0%	33,350	(1130) 24.7%	718,864
Race	Black		(17) 15.8%	11,647	(234) 19.8%	148,014
	White		(31) 15.9%	19,361	(819) 26.8%	519,303
Gender	Female		(27) 10.8%	13,255	(656) 22.5%	343,006
	Male		(24) 23.6%	20,095	(474) 27.0%	375,858
Age	<45 years		(15) 28.7%	11,108	(718) 29.4%	482,814
	45 - 64 years		(25) 16.7%	15,590	(343) 24.3%	197,608
	65+ years		(10) 8.3%	6,221	(62) 8.0%	34,793
Income	<\$15,000		(16) 19.3%	9,667	(188) 28.6%	99,996
	\$15,000 - \$24,999		(14) 20.4%	9,458	(255) 28.0%	157,887
	\$25,000 - \$49,999		(11) 19.8%	8,701	(360) 27.5%	246,218
	\$50,000+		(4) 10.1%	2,943	(206) 20.3%	138,637
Insulin	Users		(15) 14.2%	9,066	na	na
	Non-users		(35) 15.6%	21,901	na	na

For every category presented, except age 65 years and over, non-diabetics have a higher smoking prevalence than diabetics. While this is encouraging, the prevalence of smoking among diabetics is still high. Some of the greatest disparities are between gender, within and across diabetic status. Age provides another source of disparity, with younger diabetics proportionately more likely than older diabetics to be current smokers. The relationship between age and current smoking among Louisiana adult diabetics shows a gradient decrease with age. The youngest group (<45 years) of Louisiana adult diabetics smokes at a rate (29%) that is almost two times the rate (17%) of the next age group (45-64 years), and more than three times the rate (8%) of the oldest age group (65+ years). Thus, although smoking rates among adult Louisiana diabetics mirrors that of the general population, smoking poses an exceptional risk for diabetics, who are at increased risk for adverse outcomes. Smoking represents a risk factor that diabetics and non-diabetics alike must be encouraged to avoid.

3. Overweight / Obesity

a. BMI of diabetics

Because type II diabetes is by far the most prevalent type of diabetes (accounting for upwards of 95% of all cases of diabetes), and because it is associated with being overweight and/or obese, maintaining an ideal body weight (height/weight proportionate) is highly recommended as a means to prevent and manage diabetes. The body mass index (BMI), a useful measure for assessing adult body fat, is calculated thus: $BMI = \text{Weight (kg)} / \text{Height (m)}^2$. The classification of overweight and obesity by BMI is given below.

BMI (kg/m ²)	
Underweight	<18.5
Normal	18.5 – 24.9
Overweight	25.0 – 29.9
Obese	30+

Because the maintenance of an ideal body weight depends on lifestyle choices over which every individual has some measure of control, this is an area with considerable opportunity for worthwhile impact. It is also an area with particular relevance for Louisiana, where overweight and obesity are known problems. As shown in Table 19, 36% of Louisiana diabetics are overweight, and another 43% is obese. Hence, nearly four in five (80%) of all Louisiana adult diabetics are at least overweight.

Table 19. BMI among diabetics LA, 2000

Category (N)			n	Weighted %	Weighted n
Total (325)	Overweight		108	35.8%	69,328
	Obese		150	43.2%	83,489
Race	Black (114)	Overweight	37	35.2%	23,369
		Obese	58	46.1%	30,670
	White (191)	Overweight	63	35.2%	40,352
		Obese	83	42.1%	48,148
Gender	Female (216)	Overweight	64	30.3%	33,975
		Obese	108	48.8%	54,688
	Male (109)	Overweight	44	43.4%	35,353
		Obese	42	35.4%	28,801
Age	<45 years (58)	Overweight	14	31.3%	11,120
		Obese	17	39.8%	14,133
	45 - 64 years (147)	Overweight	53	35.1%	30,137
		Obese	72	48.7%	41,781
	65+ years (120)	Overweight	41	38.9%	28,071
		Obese	51	38.2%	27,575
Income	<\$15,000 (85)	Overweight	24	26.9%	13,239
		Obese	43	51.5%	25,368
	\$15,000 - \$24,999 (67)	Overweight	28	47.1%	19,382
		Obese	22	25.6%	10,512
	\$25,000 - \$49,999 (69)	Overweight	22	37.2%	15,521
		Obese	34	45.3%	18,907
Insulin	\$50,000+ (50)	Overweight	18	37.0%	10,762
		Obese	26	50.5%	14,686
	Users (96)	Overweight	33	37.4%	22,307
		Obese	41	41.1%	24,506
	Non-users (225)	Overweight	74	35.8%	46,449
		Obese	107	44.7%	58,028

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

Proportionately more Black diabetics (46%) than White diabetics (42%) are obese, which reflects a general trend observed in the Louisiana population. Another source of more considerable disparity in obesity is gender, with proportionately more female diabetics (49%) likely to be obese, relative to male diabetics (35%). Again, this observation reflects general gender disparities in obesity in Louisiana.

b. Advised by health professional to lose weight

Based on the proportion of Louisiana diabetics reporting that they are overweight or obese, it might be assumed that the health professionals who see them would advise them to lose weight as part of the comprehensive set of preventive care practices that will improve the quality of their lives, and either slow down or prevent complications. The usefulness of this variable is at least two-fold:

1. It offers an indication of the extent to which weight might be complicating the patient's diabetes.
2. It offers an indication of whether diabetic patients are receiving proper advice on managing their disease.

This is a reasonable assumption even though those receiving advice on losing weight are not matched to those reporting that they are overweight and/or obese, since one would expect such advice to be given only to those for whom weight is a problem. On this assumption, nearly 80% of Louisiana's adult diabetics need advice on losing some weight. However, only 35% reported that they had been advised by a health professional to lose weight (Table 20).

Table 20. Diabetics advised by a health professional to lose weight, LA, 2000 BRFSS

	Category (N)	n	Weighted Percent	Weight n
Total (346)		116	35.0%	72,609
Race	Black (123)	52	44.2%	32,780
	White (203)	58	30.6%	37,046
Gender	Female (233)	85	39.7%	48,675
	Male (113)	31	28.1%	23,934
Age	<45 years (61)	24	37.8%	14,656
	45 - 64 years (160)	57	38.1%	35,627
	65+ years (123)	35	30.0%	22,326
Income	<\$15,000 (88)	31	39.6%	19,876
	\$15,000 - \$24,999 (75)	22	26.8%	12,413
	\$25,000 - \$49,999 (72)	29	42.7%	18,740
	\$50,000+ (50)	19	32.3%	9,408
Insulin	Users (102)	33	37.4%	23,692
	Non-users (240)	82	34.4%	48,344

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

c. Trying to lose weight

On this variable, too, the expectation would be that a high proportion of adult Louisiana diabetics are trying to lose weight, given the high proportion who are overweight or obese. This would suggest that the diabetics, as an indication of adopting a healthier lifestyle, are doing what is necessary for them to stay within the range of normal weight through proper diet and exercise.

Less than half (44%) of the total diabetic population reported that they are trying to lose weight.

Table 21. Diabetics who are NOT trying to lose weight, LA, 2000

	Category (N)	n	Weighted Percent	Weight n
Total (346)		193	56.3%	116,886
Race	Black (123)	69	53.9%	39,996
	White (203)	114	58.5%	70,838
Gender	Female (233)	125	54.2%	66,388
	Male (113)	68	59.2%	50,498
Age	<45 years (61)	32	50.1%	19,339
	45 - 64 years (160)	83	54.7%	51,163
	65+ years (123)	76	60.8%	45,203
Income	<\$15,000 (88)	49	57.6%	28,917
	\$15,000 - \$24,999 (75)	43	60.1%	27,887
	\$25,000 - \$49,999 (72)	36	49.9%	21,923
	\$50,000+ (50)	27	56.8%	16,543
Insulin	Users (102)	64	60.7%	38,451
	Non-users (240)	126	53.4%	75,098

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

Proportionately more Black diabetics (46.1%) than White diabetics (41.5%) reported that they are trying to lose weight, and proportionately more non-insulin users (46.6%) than insulin-users (29.3%) reported that they are trying to lose weight. These proportions, overall and by category, are far below expectation, given the proportion who are at least overweight.

4. Hypertension

CDC reports that an estimated 60% to 65% of persons with diabetes have high blood pressure, putting them at increased risk for several morbidity outcomes. The rate among Louisiana's adult diabetics is in the middle of that range, as shown in Table 22. The overall rate of high blood pressure among Louisiana diabetics in 2000 was 62%, compared to a rate among non-diabetics of 24.8%.

Table 22. Diabetics ever told by a doctor that they have high blood pressure LA, 2000 BRFSS (number with high BP)

		Diabetics		Non-Diabetics	
	Category (N)	(n) Weighted %	Weighted n	(n) Weighted %	Weighted n
Total		(66) 62.1%	118,414	(385) 24.8%	699,052
Race	Black	*(28) 73.4%	54,417	(127) 31.8%	227,152
	White	(34) 53.7%	57,879	(236) 22.9%	429,959
Gender	Female	(43) 57.4%	64,806	(243) 26.9%	395,590
	Male	*(23) 68.7%	53,608	(142) 22.6%	303,462
Age	<45 years	*(13) 62.8%	25,824	(110) 14.0%	219,164
	45 - 64 years	*(28) 58.0%	44,927	(166) 35.6%	289,468
	65+ years	*(25) 66.0%	47,663	(106) 45.2%	187,875
Income	<\$15,000	*(20) 55.9%	26,665	(80) 35.2%	132,308
	\$15,000 - \$24,999	*(17) 65.0%	33,436	(79) 27.9%	146,003
	\$25,000 - \$49,999	*(13) 62.6%	25,010	(107) 22.4%	192,875
	\$50,000+	*(10) 78.9%	20,288	(61) 19.0%	125,923
Insulin	Users	*(26) 74.2%	46,541		
	Non-users	(40) 56.1%	71,873		

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

Although the numbers are small, Black diabetics (73%) appear to be particularly affected by high blood pressure, relative to White diabetics (54%). Moreover, diabetics from households with the highest total income have the highest rates of high blood pressure. For every category, however, the rate of high blood pressure among diabetics is at least twice the rate among non-diabetics. The high rates of high blood pressure brings greater urgency to the need for encouraging Louisiana diabetics to adopt lifestyle choices (nutrition and exercise) that would slow the progression of their illness and improve their quality of life.

5. Cholesterol

As with blood pressure, elevated blood cholesterol levels are associated with adverse cardiovascular outcomes. Approximately 46% of all adult Louisiana diabetics have high blood cholesterol. Among non-diabetics, the proportion with high blood cholesterol is 27.8% (Table 23). Although the numbers in the categories of diabetics are small, it is evident that Louisiana diabetics have higher blood cholesterol levels than non-diabetics. Thus, the risk to diabetics of experiencing adverse cardiovascular outcomes is higher.

Table 23. Diabetics told by a doctor that their blood cholesterol is high LA, 2000 BRFSS (number with high blood cholesterol)

		Diabetics		Non-Diabetics	
Category (N)		(n) Weighted %	Weight n	(n) Weighted %	Weighted n
Total		(44) 45.9%	72,969	(300) 27.8%	517,909
Race	Black	*(15) 42.8%	23,126	(57) 21.7%	93,179
	White	(25) 46.1%	44,172	(221) 30.2%	393,483
Gender	Female	(33) 49.4%	48,437	(196) 30.8%	298,385
	Male	*(11) 40.3%	36,298	(104) 24.5%	219,524
Age	<45 years	*(8) 45.9%	16,424	(65) 15.0%	121,606
	45 - 64 years	*(20) 45.6%	30,067	(148) 36.2%	248,446
	65+ years	*(16) 46.4%	26,478	(85) 40.8%	146,330
Income	<\$15,000	*(15) 50.5%	19,601	(59) 41.4%	93,955
	\$15,000 - \$24,999	*(10) 36.4%	14,926	(49) 26.6%	85,399
	\$25,000 - \$49,999	*(7) 46.5%	15,958	(92) 28.9%	161,128
	\$50,000+	*(7) 51.6%	13,266	(64) 21.9%	115,872
Insulin	Users	*(17) 45.4%	22,883		
	Non-users	(27) 46.2%	50,085		

*Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.

6. Consumption of fruits and vegetables

Of the lifestyle factors alluded to in early parts of this analysis, consumption of proper nutrients in moderation is an important one. Diabetics, perhaps even more than the general population, must follow good dietary practices, one of which is the adequate consumption of fruits and vegetables.

Overall, a very high proportion (78%) of Louisiana diabetics report consuming less than the recommended five portions of fruits and vegetables a day. The failure to meet this general nutritional guideline is consistent across the various categorizations (race, gender, income, etc), with the highest rate of non-adherence found for middle-aged diabetics (84%), male diabetics (82%), and diabetics from households with the highest total household income (81%).

Table 24. Diabetics who consume less than five servings of fruits/vegetables per day, LA, 2000 BRFSS

	Category (N)	n	Weighted percent	Weighted n
Total (346)		272	78.4%	162,820
Race	Black (123)	96	79.4%	58,877
	White (203)	161	78.1%	94,558
Gender	Female (233)	178	75.7%	92,715
	Male (113)	94	82.3%	70,105
Age	<45 years (61)	46	74.8%	28,981
	45 - 64 years (160)	135	84.4%	78,876
	65+ years (123)	89	72.4%	53,834
Income	<\$15,000 (88)	67	77.2%	38,768
	\$15,000 - \$24,999 (75)	60	76.8%	35,611
	\$25,000 - \$49,999 (72)	54	77.5%	34,034
	\$50,000+ (50)	41	81.3%	23,669
Insulin	Users (102)	75	73.4%	46,464
	Non-users (240)	193	80.0%	112,447

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

E. Quality of life indicators

Diabetes not only imposes severe economic costs to those affected, their families and society in general, it also exacts a considerable toll in the quality of life of those affected. Four quality-of-life indicators were chosen for analysis, comparing adult Louisiana diabetics with non-diabetics.

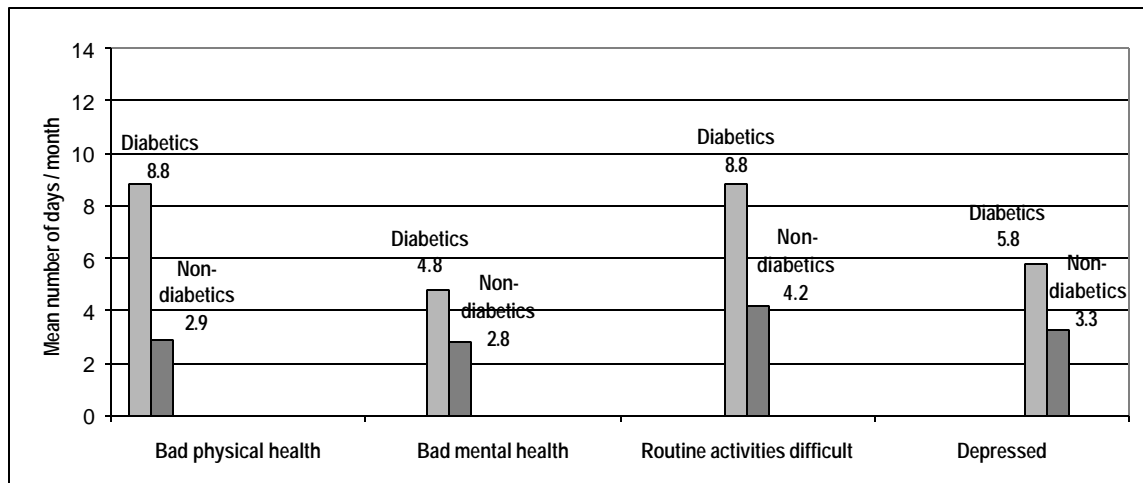
Table 25. Differences between diabetics and non-diabetics on select quality of life indicators, LA 2000 BRFSS (N)

Variable	Mean number of days per month	
	Diabetics	Non-diabetics
Days physical health not good	(323) 8.8 days	(4547) 2.9 days
Days mental health not good	(327) 4.8 days	(4585) 2.8 days
Days prevented from usual activities	(206) 8.8 days	(2060) 4.2 days
Days felt depressed	(100) 5.8 days	(1537) 3.3 days

**Denotes categories with less than 50 respondents. Inferences based on categories with less than 50 respondents should be used with caution.*

The analysis compared the mean number of days over a month, during which a person suffered from any of the four variables (poor physical health, poor mental health, inability to do routine activities and depression). The results, as shown, suggest that the quality of life of adult Louisiana diabetics is affected in several important ways (Table 25). For instance, on average, diabetics spend about one week experiencing bad physical health. In addition, diabetics average close to one week (5.8 days) of depression a month, compared with about three days in a month for non-diabetics.

Figure 6. Differences between diabetics and non-diabetics in mean number of days/month of having poor physical health, poor mental health, difficulties performing routine activities, and being depressed, LA 2000 BRFS

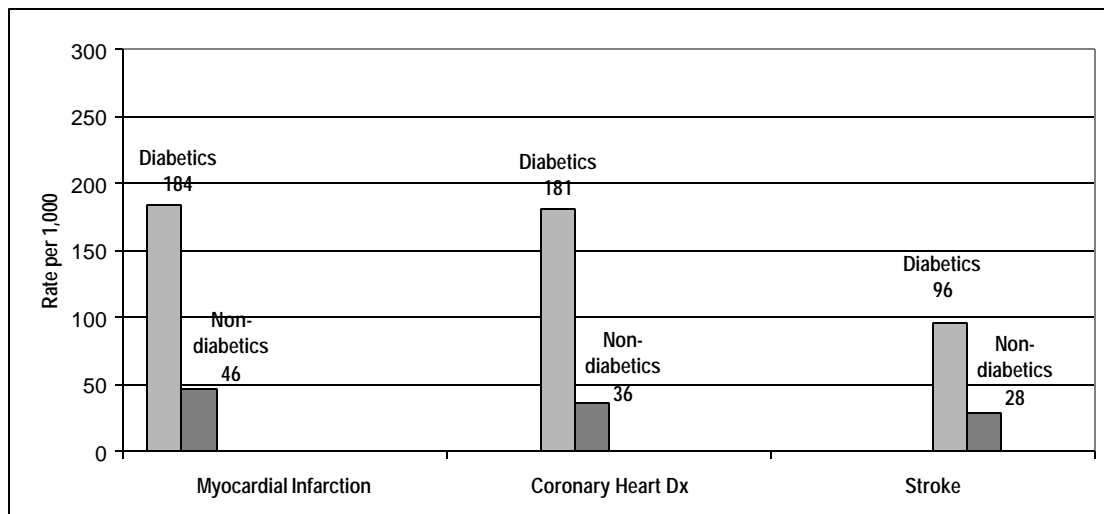


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F. Morbidity

To assess the extent to which diabetes does increase the risk of adult Louisianans to morbidity outcomes, three such outcomes were selected for analysis, comparing the rates (per 1000) between diabetics and non-diabetics. The results are presented in Figure 7.

Figure 7. Observed differences in cardiovascular disease outcomes, LA 2000 BRFS



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As can be observed from Figure 7, Louisiana diabetics have about 4 times the risk for myocardial infarction that non-diabetics have, 5 times the risk for coronary heart disease and 3 times the risk for stroke.

V. CONCLUSION

Diabetes is an important health problem in Louisiana. Approximately 7% of the adult population, or 208,500 adults, report that they have been told that they have diabetes. Research by the Centers for Disease Control and Prevention (CDC) has shown that approximately one-third of all diabetics are undiagnosed. On that evidence, the true prevalence of adult diabetes in Louisiana could be approximately 10%. Blacks are more affected, as are those from lower total income households, and those with low educational attainment.

For those affected by diabetes, following recommended preventive and curative practices is the best way to ensure a good quality of life. The analysis examined whether the important preventive practices are being followed, and whether there are differences in who follows them, so that those not meeting the recommendations might be identified.

For most of the preventive care practices, racial disparities are evident. In terms of proportions, White diabetics are proportionately less likely to check their own blood glucose, or to check their own feet. White diabetics are also more likely to have foot sores that took 4 weeks or more to heal, and proportionately more likely to report that they had not seen a doctor for their diabetes over the previous year. White diabetics are also proportionately less likely to have had their feet checked by a health professional or to have taken a class on how to manage their diabetes. Black diabetics, on the other hand, are proportionately less likely to have had the recommended number of HgA1c tests, and are proportionately less likely to have had an eye-exam, even though they are proportionately more likely to have been told that diabetes has affected their eyes. Thus in terms of racial differences, there was no clear pattern.

In terms of co-risk factors, Black diabetics are proportionately more likely to not have insurance, and to be obese (BMI 30 or greater). White diabetics, on the other hand, are proportionately more likely to be under-insured and proportionately more likely to be current smokers. Thus both groups face some difficulties in regard to health care access, although the difficulties are somewhat different. While Black diabetics were proportionately less likely to be insured, White diabetics were proportionately more likely to be under-insured. The risks posed by obesity and smoking are as varied as they are serious, especially for diabetics. The differences between the two groups on these risk factors reflect differences observed in the general population.

Some gender differences are evident as well. In terms of preventive care practices, female diabetics were proportionately more likely to report having foot sores that took four weeks or more to heal. Male diabetics, on the other hand, are proportionately less likely to do their daily blood check, see a doctor for their diabetes, get the recommended number of HgA1c tests or have an eye-exam when the pupils are dilated. Thus the women affected with diabetes appear to follow recommended practices better than the men. In terms of co-risk factors, male diabetics are proportionately more likely to be uninsured, although female diabetics are proportionately more likely to be under-insured, suggesting that both groups have some difficulties, albeit different ones, with regards to health care access. Weight issues are relevant for both genders. While male diabetics are proportionately more likely to be overweight, female diabetics are proportionately more likely to be obese and to have high blood cholesterol.

There are age differences as well. In terms of preventive care practices, the youngest group of adult Louisiana diabetics (< 45 years of age) are proportionately less likely to have seen a doctor for their diabetes, or to have received the recommended HgA1c tests, and proportionately least likely to get an eye-exam. By contrast, the oldest group of adult Louisiana diabetics (65 years or older) are proportionately less likely to do a daily blood glucose, a foot check, or to have taken a class on how to manage their diabetes. But are proportionately more likely to have foot sores that took four weeks or more to heal and proportionately least likely to have taken a course on how to manage their diabetes. Thus the older diabetics appear to be doing better in terms of accessing needed services, but not in terms of taking care of themselves as a routine of their daily living. By contrast, the youngest group (< 45 years old) have limited access due to the lack of health insurance.

The analyses suggest that for the most part, those who are on insulin follow preventive care practices better than those not on insulin. Diabetics not on insulin are proportionately less likely to check their blood glucose, check their own feet or have it checked by a health professional, see a doctor for their diabetes, have an annual eye-exam or take a course on how to manage their diabetes. Those on insulin are proportionately more likely to have foot sores that took four weeks or more to heal, and to have been told by a doctor that diabetes has affected their eyes. Thus it appears that either because the conditions of insulin users are more serious, or because the fact of taking insulin increases the likelihood that they receive more frequent reinforcement on how to manage their diabetes, those on insulin do follow preventive care practices better than those not on insulin. However, those on insulin are proportionately more likely to be under-insured, perhaps because they need more care, and they are proportionately less likely to exercise. Those not on insulin are proportionately less likely to consume the recommended serving of fruits and vegetables, and are proportionately less likely to have Medicare coverage. The former might reflect a lesser concern among non-insulin users on preventive measures related to their lifestyles, while the latter probably reflects the fact that diabetics on insulin are more likely to be disabled or to have end-stage renal disease.

V. RECOMMENDATIONS

- Public awareness and education should be directed toward all races. Whites diabetics are less likely to follow the recommended preventive practice and more needs to be done to assess why this is so.
- Male diabetics are less likely than females to follow the recommended preventive practices.
- Due to the high proportion of diabetes in adults 65 and older, there needs to be more outreach to this population. Adults 35 and under need to consult a doctor more often for their diabetes, but are least likely to have insurance.
- Income was a good indicator of who was most likely to perform recommended practice guidelines. Those diabetics from poorer households were more likely to report retinopathy, less likely to have an eye-exam, and more likely to report foot problems. However, Louisiana diabetics with the highest income are actually less likely to perform most of the recommended practice guidelines.
- Diabetics are at greater risk for all the co-risk factors examined and their quality of life is affected to a greater degree than that of non-diabetics by these co-risk factors.
- Increased emphasis on diabetes self-management and more office visit time healthcare professionals take with their patients will greatly reduce the morbidity and mortality of those affected by diabetes.